

Intelligent Protection (RMU) for DD-Frame (D8)



The Intelligent Protection Device (IPD) is a monitoring unit integrated with a CBI-electric DD-frame circuit breaker. The Intelligent Protection Device measures the current flow and the circuit breaker's status. It communicates the information via a RS-485 serial bus and enables the host system to monitor current usage and ON / OFF / Tripped contact status. The unit has an active health monitor for condition-based maintenance with the number of operations stored to memory (on-load, no-load and overload operations combined with operating conditions). Along with a readout of manufacturing information, each device has a unique ID number for traceability. It has RGB status LEDs, visible at the top and bottom, configurable for various status displays.

The RMU circuit breaker current range is from 3 A to 100 A on a single pole, up to 200 A on a double pole and up to 300 A on a three pole. The plug-in terminals are suitable for a hot-pluggable busbar style panel that includes a PCB strip with data connectors. The RMU modules self-identify their positions on the bus, based on a simple resistor scheme.

The breaker footprint allows the panel to be backwards compatible with the CBI-electric DD-Frame circuit breakers fitted with trip-alarm auxiliary, so that a panel can accommodate both intelligent and standard breakers.

Features

- Intelligent Protection + Monitoring
- Real time status monitoring
 - Circuit Breaker status (On, Off, Trip Alarm)
 - Current measurement (Amps and direction of flow)
 - Diagnostics (overload, temperature, operating hours, switching operation counters)
 - Circuit Breaker Health Estimate* (percentage remaining life, based on operating conditions)
- LED indication of circuit breaker status. Visible top and bottom.
 - Configurable color scheme for RGB LED
 - Automatic lamp test sequence while powering on
- Circuit breaker digital Information
 - Unique 64-bit ID for inventory traceability
 - Current rating (and number of paralleled poles)
 - Manufacturing date
 - Ordering information
- Modbus over RS-485 data bus, up to 40 breakers on one serial bus
- Rear plug-in data terminal for simplified back-plane design
- Hot-swappable – inserted breakers self-identify on data bus

Applications

- Telecoms
- Dark Data Centers
- Digital Twin
- Condition Based Maintenance
- Energy optimisation
- Battery management



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Technical Data:

Product Type	Circuit Breaker			
Approvals	UL489A			
Number of Poles	1P	2P Parallel	3P Parallel	
Maximum Voltages	80 Vdc	80 Vdc	80 Vdc	60 Vdc
Current Ratings	3 - 100 A	110 - 200 A	160 - 250 A	300 A
AIC	10 kA			

Verify approvals for specific ratings in accordance with the relevant test certificate

Breaker specifications – see DD-Frame Circuit Breaker Data Sheet

RMU Parameter	Value
RMU module supply voltage	6 Vdc to 12 Vdc
Supply current consumption	<75 mA, per pole
Operating Ambient Temperature	-20°C to 60°C
Isolation (Breaker terminals w.r.t. data bus)	1.5 kV AC for 1 minute
Current Measurement Accuracy:	
DC Reading Error (-In < I < In)	< ±2% of In
DC Measurement Range	-1.5 to 1.5 x In
Temperature Indication Accuracy	±5°C
Modbus RS-485 Interface:	
See application note for further details	115200 bps, half-duplex (1 pair)
Bus address range, (maximum number of devices)	1 to 40, (40)

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Ordering Information

To order a DD-Frame with RMU, select 8 in Group 2 from the DD-Frame circuit breaker ordering code.

Group 1: Frame	Code	Description	Comments	
	D	DD-frame RMU		
Group 2: Type	Code	Description	Comments	
	8	Remote monitoring unit	RMU module attached to DD-frame unit	
Group 3: Mounting	Code	Description	Comments	
	A	Front mount, rectangular aperture, standard (toggle) handle type	Warning: Maximum penetration depth into the product by the mounting screw is 6 mm	
Group 4: Handle Type or Blank For Reduced Handle	Code	Description	Comments	
	2	Standard handle, midtrip	Toggle	
	A	Standard handle	Toggle	
Group 5: Termination	Code	Description	Comments	
	3X	Plug-in (Bullet) Terminal (dia 7.8 mm x 16.4 mm)	100 A max per terminal (80 Vdc) and 125 A max per terminal (60 Vdc)	
Group 6: Number of Poles	Code	Description	Comments	
	1	1 pole metric		
	2	2 pole metric		
	3	3 pole metric		
	A	1 pole imperial		
	B	2 pole imperial		
	C	3 pole imperial		
Group 7: Rated Voltages and Frequency - Main Circuit	Code	Description	Comments	
	N	80 Vdc		
	V	60 Vdc	(300 A) 3 pole parallel	
Group 8: Time Delay Characteristics	Code	Description	System	Pulse Tolerance (X In)
	AS	Long delay	DC	8 - 10
	BS	Medium delay	DC	8 - 10
	CS	Short delay	DC	6 - 8
	H3	Short delay	DC	6 - 8
Group 9: Main Circuit Current	Code	Description	Comments	
	0300	3 A	Specific Ampere rating possible from 3 A to 250 A (80 Vdc) 300 A only 3 pole parallel @ 60 Vdc	
	1000	10 A		
	K250	250 A		
	K300	300 A		
Group 10: Circuit Configuration (circuit breaker's internal construction)	Code	Description	Comments	
	BX	Circuit breaker (series trip, current coil in series)		
	LA	Circuit breaker with mid trip handle	Handle goes to mid point when electrically tripped	
Group 11: Auxiliary and Alarm Switches Types & Options	Code	Description	Comments	
	X	Not applicable		
	M	Parallel bridge housing - for all parallel bridge poles	Use this code for ALL parallel bridged products	
Group 12: Voltage and Current Ratings for Dual Control, Shunt and Relay Trip Construction	Code	Description	Comments	
	XX	Not applicable		
Group 13: Terminal Options for Dual Control, Shunt and Relay Coils	Code	Description	Comments	
	X	Not applicable		
Group 14: RMU Model	Code	Description	Comments	
	A	RMU - Type A	Specific type as per customer request	
	B	RMU - Type B		
Group 15: Customer Specific	Code	Description	Comments	
	X	Not applicable		
	S	Customer Specific		
Group 16: Handle Colour	Code	Description	Comments	
	B	Black handle, white marking		
	W	White handle, black marking		

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Ordering Information

Code	Description	Comments
Group 17: Handle Markings		
D	I – O and ON - OFF	For products requiring VDE & UL approvals
H	I – O and ON - OFF and ampere rating	
Group 18: Mounting Orientation for Marking		
V	Vertical (standard mounting, line at the top)	
Group 19: Front Plate Marking and Test Button		
A	Standard marking, standard handle	I – O and ON - OFF and ampere rating
Group 20: Inter-phase Barrier and Terminal Cover		
X	Not applicable	
Group 21: Approvals (Product Normally Approved to)		
3	UL 489A	DC (telecommunication)
Group 22: Safety Marks		
X	Not applicable	

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Digital Circuit Breaker Information:

* For detailed communication information, please see the Modbus Protocol Application Information for the Intelligent Protection Device (IPD).

- **Installed position detection**
The RMU acquires its Modbus address by means of a resistor value connected between the address pin and ground. Provided that each breaker position is fitted with 1 of 40 unique resistor values, each breaker automatically detects its installed position and sets its Modbus address accordingly.
- **Unique 64-bit ID**
Each RMU is factory programmed with a unique 64-bit ID. This can be used for inventory tracking.
- **Circuit Breaker current rating and number of paralleled poles**
Provides the ability to confirm the installed inventory in circuit breaker panel. In the case of multi-pole paralleled breakers, the controller can determine whether a breaker takes up multiple circuit positions.
- **Manufacturing date (Year, Month, Day)**
Allows the controller to determine the age of installed inventory
- **Ordering information (CBI Re-order Number)**
Ordering code used to uniquely identify the product configuration. Allows re-ordering a direct replacement if needed.
- **Protocol Version**
A revision number to identify the firmware version running on the RMU.

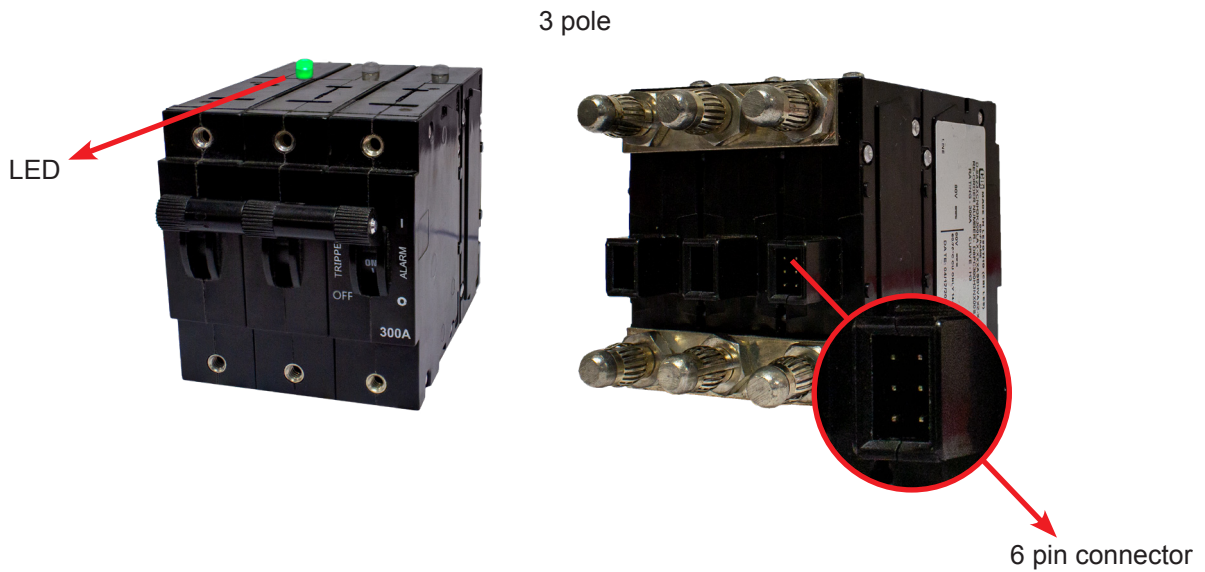
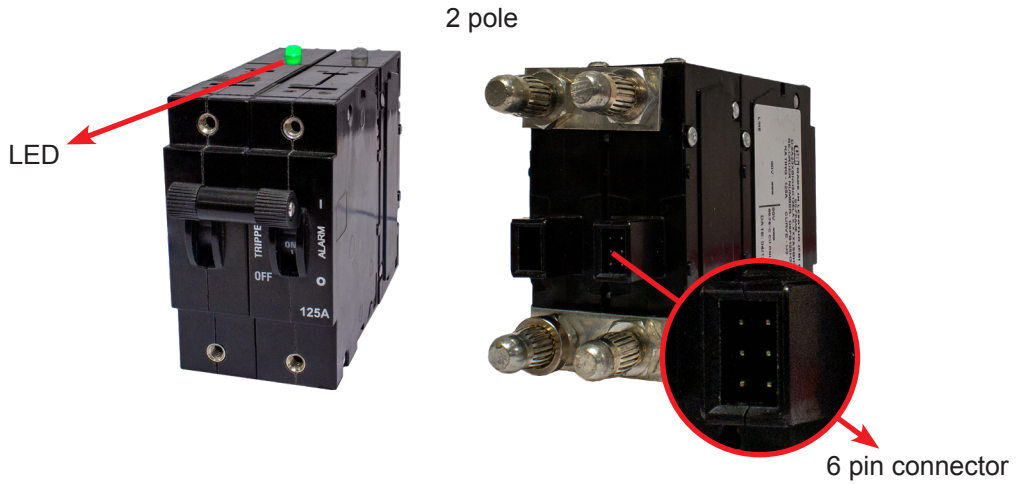
Digital Live Status Information:

- **Circuit Breaker contact status (On, Off, Trip Alarm)**
Like an auxiliary switch, this field reports the present contact status.
The virtual trip-alarm is set when the RMU detects the contacts opening during an over-current.
- **Current measurement**
Accurate current readout and direction of flow
- **Internal temperature**
Temperature indication can be used as a diagnostic aid
- **Number of switching operations***
Counters of switching operation, separated into no-load (mechanical), on-load (electrical) and overload (fault condition) operations
- **Number of operating hours***
Cumulative running time over entire device life
- **Health Estimate***
Expressed as a percentage remaining life, the device health is based on recorded operating conditions. It is recommended to replace the circuit breaker if the health reaches 0%.
- **LED Indication**
Readout of the present LED indication. This enables a remote control interface to mimic the device appearance.
- **Additional diagnostic warning indicators**
See the application information for details

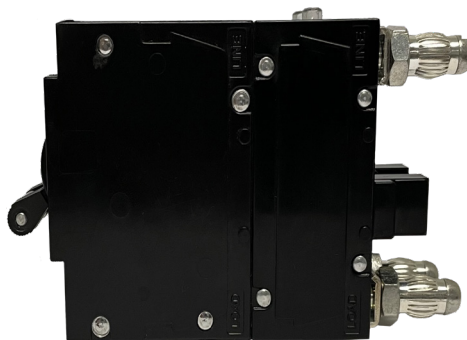
* Disclaimer: The health indication is based on recorded operating conditions and serves as a guide for preventative maintenance. The end-user can only derive the full benefit of this feature if the RMU is powered during these events, to record the occurrence. This feature is only a recommendation. A breaker that is damaged should be replaced regardless of showing a positive health value.

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The LED and 6 pin connector for communication and power is mounted on the left hand side of the circuit breaker, as seen on the 2 pole and 3 pole.

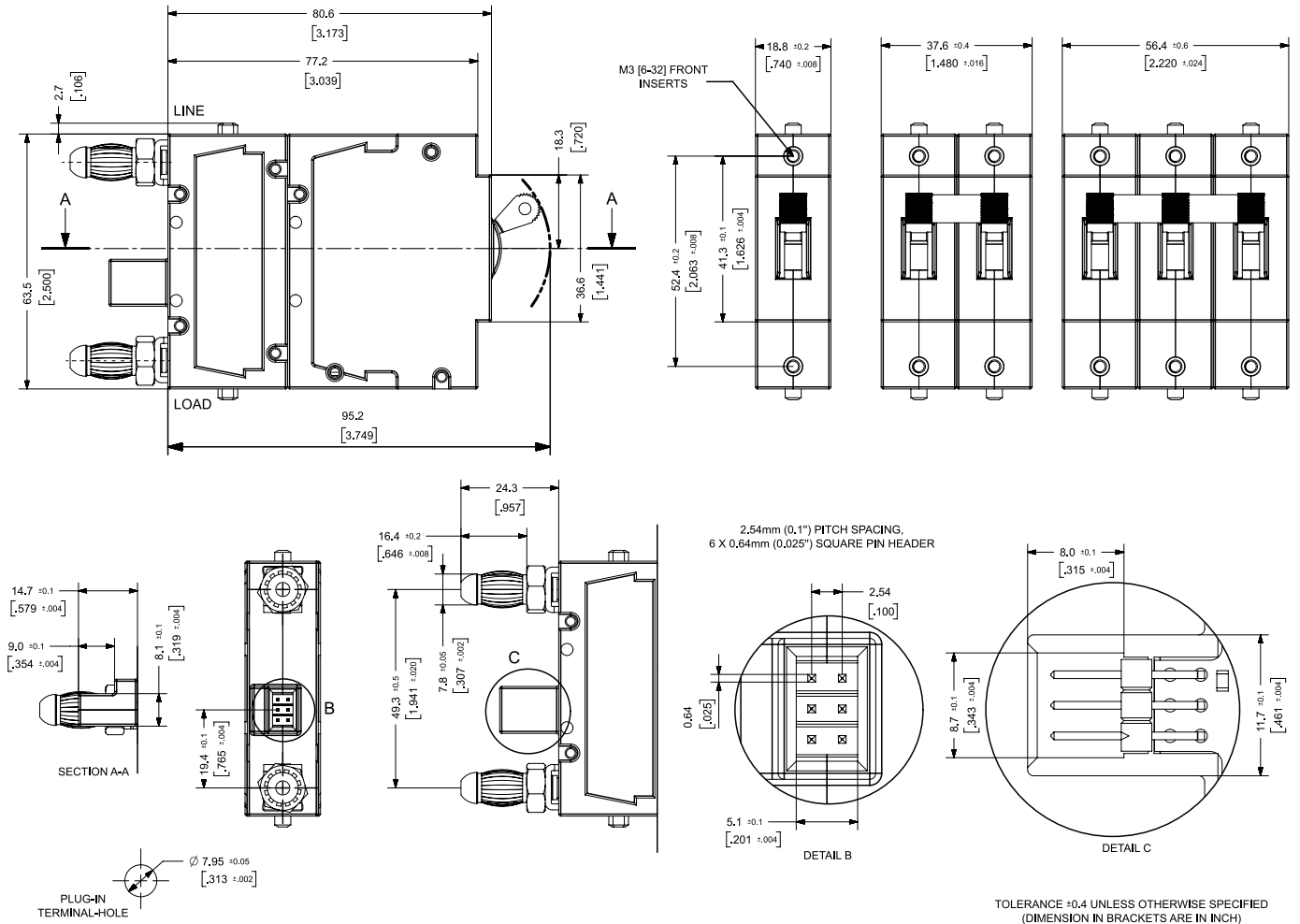


Side view of a 2 pole RMU



Intelligent Protection (RMU) for DD-Frame (D8)

Outline Dimensions



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